

Appendix 1: Country Case Studies

Indonesia

The people of Indonesia suffer from dangerous working conditions in a variety of situations. Yuyun Ismawati from Balifokus reports workers handling contaminated ashes from medical waste burning without protection, and scavenging and recycling infectious wastes.



Hospital incinerator ashes in one hospital in Medan, North Sumatera, dumped in the hospital compound being moved by workers with no protective gear. Due to the rapid city development, some hospitals now situated in densely populated areas pose higher risks to the surroundings (@Balifokus).

The environment is polluted by medical waste incinerators, which will not meet the standards of the Stockholm Convention (Indonesia has been a party to the convention since 2009), and by medical waste dumped in the open and washed up on the beaches. An evaluation of medical waste treatment practices was announced by the government in 2010, but the information has not been released.

According to Ms Ismawati:

"Most medical wastes in Indonesia are handled by unskilled waste collectors. The national regulations and permit procedures for medical

and hazardous wastes collectors are set by the MoE but cannot be achieved or not comply at the local level. As a result, the infectious and hazardous and wastes from hospitals and clinics are handled by ordinary waste collectors or city-owned waste collection agency and dumped in the city landfill or empty spaces. During the rainy season some of the wastes will be washed out to the rivers, water body and eventually the ocean/beaches.

During the monsoon season in Bali (December-April), lots of syringes and needles washed up on the West coast of Bali. After April, everything disappears but I believe they will end up stranded in other part of the island or in another part of Indonesia.



Syringe washed up on a beach in western coast of Bali during the 2010 monsoon season poses risks to beach maintenance workers, tourists and general public (@Balifokus).

IV tubes in Indonesia are considered as hazardous wastes due to their infectious potential, but scavengers and waste collectors- especially those who have contracts to pick up everything from hospitals- sell IV tubes for recycling to increase their revenues. I found it

also occurring in other Indonesian cities such as in Jakarta and the surrounding cities and as far as Medan in North Sumatera.



A typical medical waste incinerator, showing stains where black smoke leaks from the primary combustion chamber, and unburned waste scattered on the floor. Most medical incinerators are operated below 600o C and feed by diesel fuel lead to high cost medical wastes operations. (@Balifokus)

They recycle the IV tubes, turn it into flakes and send it to the recycling facility or middle men. The dilemma is that activity is against the law, but actually if we are able to clarify or set a better rule on medical waste management, we'll be able to provide proper guidance for recycling it safely.

Most of the wastes collected from hospitals, most likely will be brought to the waste collectors' facility to be segregated further by the workers or waste pickers hired by the waste collector. The way they separate wastes poses risks to the workers. Unfortunately it has not been possible to get photos due to limited access to that facility, and most of the waste collectors were not comfortable to be photographed.

Regarding government oversight and access to information, the Ministry of Environment office was due to announce results of PROPER Hospital 2010 results (PROPER is a Performance Evaluation Rating System) by the end of 2010. However, although PROPER 2010 results have been released for other sectors, the hospital results have not been published by the end of April 2011".

No	Parameter	Unit	Results
1.	As	Ppm	1,820
2.	Cd	Ppm	5,689
3.	Cr	Ppm	76,42
4.	Pb	Ppm	8,357
5.	Mn	Ppm	101,28
6.	Hg	Ppm	2,39
7.	Ni	Ppm	32,67

Ambient air quality in one local hospital in Bali (Muliarta 2008)

No	Parameter	Unit	Analysis		
			At the Incinerator site	10 m from the Incinerator	Neighborhood
1.	Particulate	$\mu\text{g}/\text{Nm}^3$	111,12	55,56	110,13
2.	NO ₂	$\mu\text{g}/\text{Nm}^3$	22,854	25,919	20,827
3.	CO	$\mu\text{g}/\text{Nm}^3$	1422,23	1706,67	1848,89
4.	SO ₂	$\mu\text{g}/\text{Nm}^3$	193,237	136,305	164,89
5.	CO ₂	$\mu\text{g}/\text{Nm}^3$	528528,50	1585585,60	264264,26
6.	Pb	$\mu\text{g}/\text{Nm}^3$	0,734	0,318	0,358

Latin America

Argentina has approved several laws during the 1990's that aim to administrate and manage integrally hospital waste, many of which have not updated their criteria regarding the infective risks. This implies that sometimes common waste is disposed of as if it were infectious.

In general terms, there is no proper segregation of hazardous waste (including chemicals), which are usually disposed of with infectious wastes or collected in containers which are then discarded in drains, contaminating the environment, affecting public health.

Several Argentinean provinces and districts have passed legislations prohibiting the incineration of infectious waste (and proposed the usage of autoclaving for its treatment instead). But where laws hadn't been approved, incineration is used, polluting air, generating diseases and affecting people's right to health.

In the rest of Latin America, newspaper articles depict a pattern of problems regarding medical waste management in different countries that include low collection coverage, unavailable transport services to a lack of suitable treatment and disposal facilities. For example, a newspaper article from Nicaragua from December 2010 (<http://www.laprensa.com.ni/2010/12/11/nacionales/46047>) depicts how medical waste including sharps was regularly found in open air landfills without any proper disposal treatment.

These problems regarding unsatisfactory solid waste management lead to increased contamination levels not only regarding the water, land and air pollution, but also put people and the environment at risk, affecting also their right to a healthy life. An example of this can be seen in the article published in a newspaper from Honduras, from October 2010 (<http://www.laprensa.hn/Pa%C3%ADs/content/view/full/445742>) in which a report from the PAHO (Pan-American Organization of Health) details the way waste is incorrectly handled, affecting the health of all related in the process and, as a consequence, impacting their right to a safe working environment.

What is more, according to the information of some of the article, in countries like Peru, Colombia, Costa Rica and Ecuador, the use of appropriate treatment and disposal technologies seems to be rare. Some commonly used disposal practices are: open and uncontrolled dumping instead of sanitary landfill; burning instead of autoclaving; exposing people to health hazards; contributing to air pollution and creating opportunities for the spread of diseases. This pollution deprives people of the right to safe water, air and environment, affecting their right to health and to life.

In some countries, even if there is some waste management infrastructure, this is usually poorly managed; badly segregated waste often ends up being burned in outdated incinerators. Even if the incinerators are more modern, they are poorly maintained.

Nepal

Nepal has many problems with medical waste which impact adversely on the human rights of its citizens.

Health Care Foundation Nepal (HECAF) has been working on medical waste management since 1999. The director of the Medical Waste Management Project, Mahesh Nakarmi, has investigated the illegal medical waste trade. Syringes are often washed out and sold back to the public.



Small scale hospital incinerator in Nepal. A chicken hunts for food nearby (Nakarmi/HECAF).

There is a national guideline on medical waste management, but it has not been implemented. As a result, many hospitals use small scale incinerators, or open burn or dump the waste in their premises. Much waste is also dumped on river banks or other open ground. Animals such as cows, dogs and chickens pick through the waste searching for food. Another common option is to dispose of waste with the municipal waste. This can be left in piles in the hospital grounds or on the street until the garbage

collectors come. All of these factors impact the right to a healthy environment

The right to a safe working environment is denied many people, especially the poorest. Hospital staff have to contend with dirty conditions in the hospital grounds and in the hospital, where there are not enough bins to segregate the waste, or sharps containers. An unpublished survey of the hospital workers in the city of Pokhara found that 11% of needle stick injuries happened during waste disposal. Cleaners are not trained, have inadequate protective clothing and are usually not vaccinated. According to Nakarmi, multi-dose immunisations for hepatitis are often not completed, leaving workers with only partial protection.



Young ragpicker collecting medical waste (Nakarmi/HECAF).

Waste is often sold to recyclers directly by hospital staff. Ragpickers, including many children, also look for medical waste to sell. They often suffer needlestick injuries. Some of them are completely dependent on the medical

waste. Ragpickers are often seen in hospital grounds; it may be an important part of their territory. Nepali environmentalists tell the story of one Nepali boy who comes to a hospital at 3pm every day to collect waste. This allows him to buy medication for his sick mother and eat one meal a day.

Nepal is one place where hospitals ask the poorest patients to bring their own syringes, which they often buy from small pharmacies that do not have good quality controls. It is well known that some of the syringes that these places sell are repacked, and therefore potentially infected. A lot of the waste recycling happens over the border in India. These practices all affect the right to life and health of the Nepali people.

HECAF is working with a number of hospitals. They are training people in segregation and injection safety, and helping substitute mercury. They have also set up autoclaves to sterilise the waste. At Bir hospital, the oldest in the capital, Kathmandu, they are able to sell 40% of the waste to offset the cost of the system. Nakarmi stresses the need for a participatory approach in the training and his team work closely with the medical staff to

make sure that they understand the system and that it fits with their way of working.



Nepali newspaper report on "Fake Syringes in the Hospitals" (Naya Patrika newspaper, Nepal)

The biggest problem for HECAF is funding. Even though they have support from WHO and HCWH, Nakarmi has to work as a consultant in other fields to get the money to sustain the medical waste work. Even so, the team work unpaid most of the time. Groups like this- and the hospitals of Nepal- need adequate funding to carry out this lifesaving work.

Pakistan

Pakistan has medical waste management guidelines, published in 2005 (PMoE 2005). These place the responsibility for the treatment of waste on the hospital, even assigning duties to specific members of the medical and administrative hierarchy. The roles of the government are also spelled out, including the constitution of committees and action to be taken if Health Officers find any deviation from the rules.

Unfortunately, these rules are not being implemented, and the main disposal routes for medical waste are: sale to plastics recyclers, open burning, low quality incinerators, and dumping either on the hospital premises or public areas where ragpickers can access them. The picture below shows anatomical waste being scavenged by cats.

This widespread dumping denies the majority of the population their right to a clean environment.

In 2007, *The News* in Pakistan reported that hepatitis C was spreading among young ragpickers as they collected used syringes and other clinical waste. According to the Additional Secretary Health Dr Iqbal Saeed Khan, 50,000 garbage collectors, many of them children, were suspected of being infected. Given that these people are unlikely to be able to access proper treatment, this effectively is a violation of the right to life and health.

In 2007, the Director of the EPA blamed staff shortages for the lack of enforcement, and claimed the situation would soon improve. In 2008, a petition was brought before the High Court by attorney Qazi Ali Athar, citing the improper disposal of medical waste, including pollution from medical waste incineration and the illegal repackaging of syringes as a violation of the right to life and health enshrined in the Pakistan Constitution and environmental law. In response, in 2010, the

High Court called for the Hospital Waste Management Rules 2005 should be strictly enforced and any violation be reported to the Environmental Tribunal.

However, newspaper reports in 2010 and 2011 indicate an almost complete lack of implementation. They also noted that there is no record-keeping, and officials from the Khyber Pakhtunkhwa government pointed out the lack of a system to record whether someone has been infected by hospital waste, so there is no accurate information available.



Cats scavenging pathological waste in Karachi (Altaf)

The right to a safe working environment is also compromised by the poor waste management. In Karachi, the trade in used syringes has been traced from the young scavenger boys via intermediate sellers to the major plastics recyclers (Mujeeb *et al* 2003). Given that the syringes had been dumped without treatment, anyone who came into contact with them would have been at risk of injury and infection. Scavengers reported up to three needlestick injuries per week and healthcare waste dealers reported up to two needlestick injuries per week.

The main use of these syringes was as feedstock in manufacturing new plastic items, but some were also washed and packaged for sale as new, putting the health of the public at risk.

Hospital and healthcare workers are also denied clean working environments in many cases. While reports of the situation inside the hospitals are naturally rarer than reports of waste dumping in public areas, is unlikely that in a system so flawed, the waste workers will be afforded vaccinations, training and protective equipment. Indeed, a 1994 study

showed high levels of hepatitis B in hospital workers, with the highest reported level in sweepers in a medical centre (Altaf & Mujeeb 2002).

Despite regular initiatives, the situation remains poor. The Punjab Environment Department has recently launched a drive to implement the Hospital Waste Management Rules. During their last effort, 955 cases were registered against hospitals, clinics and laboratories for non-compliance, but only 171 reached the Tribunal stage. Widespread recycling of medical waste continues

Philippines

In years past, before the ban on incineration of all wastes in year 2000 and the total ban of incinerating health care wastes in 2003, the Philippines experienced the most polluting waste disposal system- burning.

Different stakeholders within the communities where the medical waste incinerators were built have complained of human right violations. They asserted that their basic right to breathe clean air was violated by hospitals owners and administrators, the vendors of incinerators and the local and national governments that allowed such dirty systems and technologies to operate.

The featured case here is about the incinerators that were deployed in different government run hospitals. These incinerators were acquired by the Philippine government via a loan. This is to highlight the case that it is not only the right to clean air was violated but also the payment of erroneous loans such as this interfered with their right to healthcare and there for the right to life and health.

In 1996, the Philippine government entered into a loan agreement worth 503 million pesos which involved a buyer export credit facility agreement to purchase 26 medical waste incinerators and 36 disinfection units for government-run hospitals.

Shortly after the agreement, the country banned the use of medical waste incinerators under the Clean Air Act. However, in 2002, the government started paying the amount of US\$2 million a year and is set to pay until 2014 with an interest rate of 4% annually.

The medical waste incinerators failed the emission tests conducted by the Department of Environment and Natural Resources,

Department of Health and the World Health Organization. In a 2003 emission test, one of the incinerators exceeded the Clean Air Act limit set for dioxins.

In the 2008 General Appropriations Act, the Austrian loan was included in the list of those loans challenged as fraudulent, wasteful, and useless.

"In 2000 a US Congress Report of the International Financial Institution Advisory Commission known as Meltzer Report concluded that total cancellation of poor-country debt was essential for development.

"In the 2008 National Budget alone, US\$2 million is equivalent to the combined budget for the formulation and development of National Health Policies and Plans including essential National Health Research (Php41M), Health Systems Development (Php21M), provision for a pool of 60 resident physicians (Php11M), and provision for a pool of 136 part time medical specialists and 10 full time (Php19M)." - Merci Ferrer, HCWH Southeast Asia Executive Director.

In 2003, Philippines' government expenditure on health as a percentage of total health expenditure is only 43.7% compared to Malaysia's 58.2% and Thailand's 61.6%. Total health expenditure as a percentage of GDP is only 3.2% vis a vis WHO recommended 5%.

The repayment of this loan would take away funding from the healthcare budget which could otherwise be directed to providing a safe and sustainable healthcare waste treatment, which would be more in line with the rights to life, health and a healthy environment of the Philippine people.

South Africa

Despite being one of the richest and best regulated countries in Africa, South Africa has experienced a number of medical waste scandals in recent years. The most frequently reported incidents concern the contamination of the environment. In 2010, syringes, rubber gloves, and blood-stained materials were found near a soccer pitch in southern Pretoria (Gauteng province), HIV test kits were dumped near a primary school in Bloekombos, a suburb Cape Town (Western Cape) and both private and public hospitals were found to be responsible for dumping waste including syringes and gowns in Marianhill (KwaZulu Natal).

The most significant recent scandal broke in November 2009, when waste including amputated limbs, placentas, blood-soaked materials, syringes and discarded were found at four sites around the town of Welkom in the Free State. In total, over 17000 tonnes of waste were found, at a brickworks, the Welkom showground, a goldmine and a game farm. The company involved, Wasteman, is the second largest in the country, and has contracts with 150 of the largest public and private hospitals and clinics. The cleanup cost 53 million rand (7.9 M USD)

Environmental contamination also comes from medical waste incineration. Several have been closed down due to poor operation and non-compliance with environmental regulations, but the environmental group groundWork believes that they will not be able to meet pending standards and will be shut down if the Department of Environmental Affairs enforces the standards.

There are fewer reports of incidents where the safety of people's working environments have been compromised, but they still occur. In May 2010, less than three weeks after waste was dumped in the city of Marianhill, the

Department of Agriculture, Environmental Affairs and Rural Development closed down a recycling facility there, after medical waste, including syringes, was found in the ordinary black bags destined for recycling and it was decided that *"it would have been too dangerous for workers to continue working at the facility"*.

These problems have been ascribed to the lack of capacity in the country for treating medical waste. During a briefing by the director of authorisations and waste disposal management, the government environment affairs committee were told that, in 2007, the country produced 42,200 tonnes of waste, 6000 tonnes more than the available treatment capacity. Poor staff training also meant that risk waste was mixed with non-hazardous general waste, increasing the amount that required specialist treatment. groundWork also regard existing legislation as deeply flawed. In their analysis of the Welkom situation, Rico Eurpidou wrote that only 5% of the 42,200 waste was anatomical waste, and if only that were incinerated, the capacity problems would be solved. The rest of the waste could be autoclaved, and much of it recycled.

groundWork also believes that there is a need for more information and a Commission of Enquiry into the operations of the medical waste management industry, including contracting; the process of awarding government tenders; the ability of the government to monitor and enforce compliance; alternatives to incineration; and recommendations to improve the regulation and management of medical waste at the national level.

In February of this year, seven individuals, representing 9 companies, appeared in court, accused of illegal medical waste dumping, corruption and contravening the National

Environment Management Act. Allegations of kidnapping and intimidation of witnesses have also been reported in the press. The maximum penalty for illegal dumping of medical waste is 10 years imprisonment and/or a fine of R10,000,000 (1.5M USD). Whatever the outcome of the court case, it is unlikely to represent the last word on the problems with medical waste management in South Africa.